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I, JONNE YABSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PR 2871 for a patent by AUSTRAL LOCK INDUSTRIES P/L filed on 06 February 2001.

I further certify that pursuant to the provisions of Section 38(1) of the Patents Act 1990 a complete specification was filed on 15 June 2001 and it is an associated application to Provisional Application No. PR 2871 and has been allocated No. 51955/01.

WITNESS my hand this
Fifteenth day of August 2001

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PROVISIONAL PATENT APPLICATION

Title: Improvements in Catch Plates

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The invention comprises padlocks and a means of manufacturing padlocks. Two types of padlock are envisaged, one (Type 1) which may be opened while having the key removable and another (Type 2) where the key cannot be removed unless the shackle is closed. I.e. both shackle legs are within the body of the padlock. The padlocks are operated by turning a key to turn a cylinder to turn a cam that controls two balls.

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A Type 2 padlock is shown in Fig 1 to in which

Fig 1 shows a padlock with a closed & locked shackle

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Fig 2 shows a portion the padlock of Fig 1 from the opposite side

Fig 3 is a partial cutaway isometric view without the cylinder of a closed & locked padlock

Fig 4 is a partial cutaway isometric view without the cylinder of a closed & locked padlock

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Fig 5 is a partial cutaway isometric view without the cylinder of a closed & locked padlock

Fig 6 is a partial cutaway isometric view without the cylinder of a closed & locked padlock.

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Fig 5 Fig 6 is a partial cutaway isometric view without the cylinder of a padlock where the cam has been rotated to align the recess 25 with the ball 22.

All Figs show a padlock body 1, with a short cylindrical aperture 2 and a long cylindrical aperture 3 to accommodate shackle 4 legs being the short leg 5 and the long leg 6. There is at the opposite end 9 of the body a cylinder aperture 8 of figure 8 cross-section comprising part of a long cylindrical aperture 10 connected to an short adjoining part of a cylindrical aperture 11 and these four apertures have parallel axis.

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The cylinder 12 has a mating figure 8 cross-section and it locates with minimal clearances in the aperture 8 where it is retained by a screw 13 which passes from the bottom of the short aperture 2 to engage threadedly in a threaded recess 14 in an inner end of the cylinder. The barrel 26 supported coaxially with the axis of aperture

10, within the cylinder has an inner end cross-slot 15, a raised arcular shoulder 17 and a circlip groove 16.

5 A cam 18 located within aperture 10 has two opposite circumferential locking shoulders 19 and 20 to (in a Locking Configuration) respectively hold a first ball 21 and a second ball 22 outwardly to retain the short leg and the long leg of the shackle respectively. There is also two opposite recesses 23 and 24 which enable the balls to move inwardly away from the legs (in an Unlocked Configuration) of the shackle to enable the shackle to be opened – described below. At the inner end, adjacent the
10 cylinder the cam has a raised arcular shoulder 25 that locates adjacently with the shoulder 17 so that the cam may be driven by the cylinder without free movement.

The barrel 26 is retained in the cylindrical housing 27 by a circlip 28 which locates in the circlip groove 16 and so that inwardly disposed shoulders of the circlip locate in
15 the slot 15 to maintain the disposition of the circlip in relation to the barrel. The circlip has a radial extension 19 which is within the aperture 11 and allows the barrel to angularly displace between the position shown in Fig 4, corresponding to the Locking Configuration and the position shown in Fig 6, corresponding to the Unlocked Configuration.

20 If the cylinder is removed the cam can be turned further so that the recess 25, a recess deeper than 24 becomes adjacent the ball 22 as shown in Fig 7 enabling the removal of the shackle. Recess 25 is deep enough so that the ball 22 can completely withdraw from the annular groove 29.

25 Within the short leg 5 is a recess, preferably a spherical recess and opposite in the long leg is an identical recess joined by an elongated spherical recess 40 of lesser depth which joins at a lower end a peripheral recess 29 – the elongated portion and peripheral recess being of equal depth into the body of the shackle. In the Locked
30 Configuration each ball is partly in one of these recesses, in the unclosed position with the leg 5 removed from aperture 2 the ball 22 is within groove 29, having moved (relatively) down the channel 40 to reach this groove.

A Type 1 padlock is shown in Fig 1 to in which

35 Fig 11 shows a padlock with a closed & locked shackle

Fig 12 shows a portion the padlock of Fig 1 from the opposite side

Fig 13 is a partial cutaway isometric view without the cylinder of a closed & locked padlock

Fig 15 is a partial cutaway isometric view without the cylinder of a closed & locked padlock.

5 Fig 16 is a partial plan view showing the spring and circlip in relation to the apertures.

It can be seen that Type 1 padlocks have a circlip 30 (as described above) on the cam which has a circlip groove 31 to accommodate the circlip and two side apertures 32 to accommodate the circlip shoulders 33. There is also a leaf spring 34 supported on the cam adjacently the circlip to bias the cam towards the Locking Configuration –
 10 this leaf spring has one end fixed in a recess 35 in the cam and the other against a side wall of the aperture 11. For this type of padlock the shackle can only be removed by displacing the cam from its operating position because the circlip prevents the recess 25 from being aligned with the ball 22. Importantly, the arcular
 15 shoulder 36 of this cam is smaller providing angular free moment 37 between the cam and barrel enabling the barrel to be moved to the undisplaced position and the key removed while the cam is retained in the Unlocking Configuration – this being caused by the ball 22 which is retained in and by the groove 29 to retain the ball 22 in the recess 24 to prevent the cam from rotating under spring bias. The circlip retaining
 20 the barrel need not have the arm 29 but for consistency it should.

Importantly the circlip is configured such that once in the cylinder recess, the shoulders of the circlip cannot leave the recesses 33 or the slot 15 whichever is applicable so that relativity between the circlip and cam or between the circlip and
 25 barrel whichever is applicable is always maintained.

Importantly it should be noted that a Type 2 padlock could be converted to Type 1 simply by substituting cams and including a spring. A Type 1 padlock can be converted to Type 2 simply by substituting cams and excluding the spring.

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Many padlocks also include a spring 39 to bias the shackle from the body.

Throughout this specification and claims which follow, unless the context requires otherwise, the word "comprise", or variations such as "comprises" or "comprising",
 35 will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

Throughout this specification and claims which follow, unless the context requires otherwise, the positional prepositions such as rear, forward are used to assist in description of the preferred embodiments and have in general no absolute significance.

5 Austral Lock Industries P/L Pty Ltd

February 5, 2001

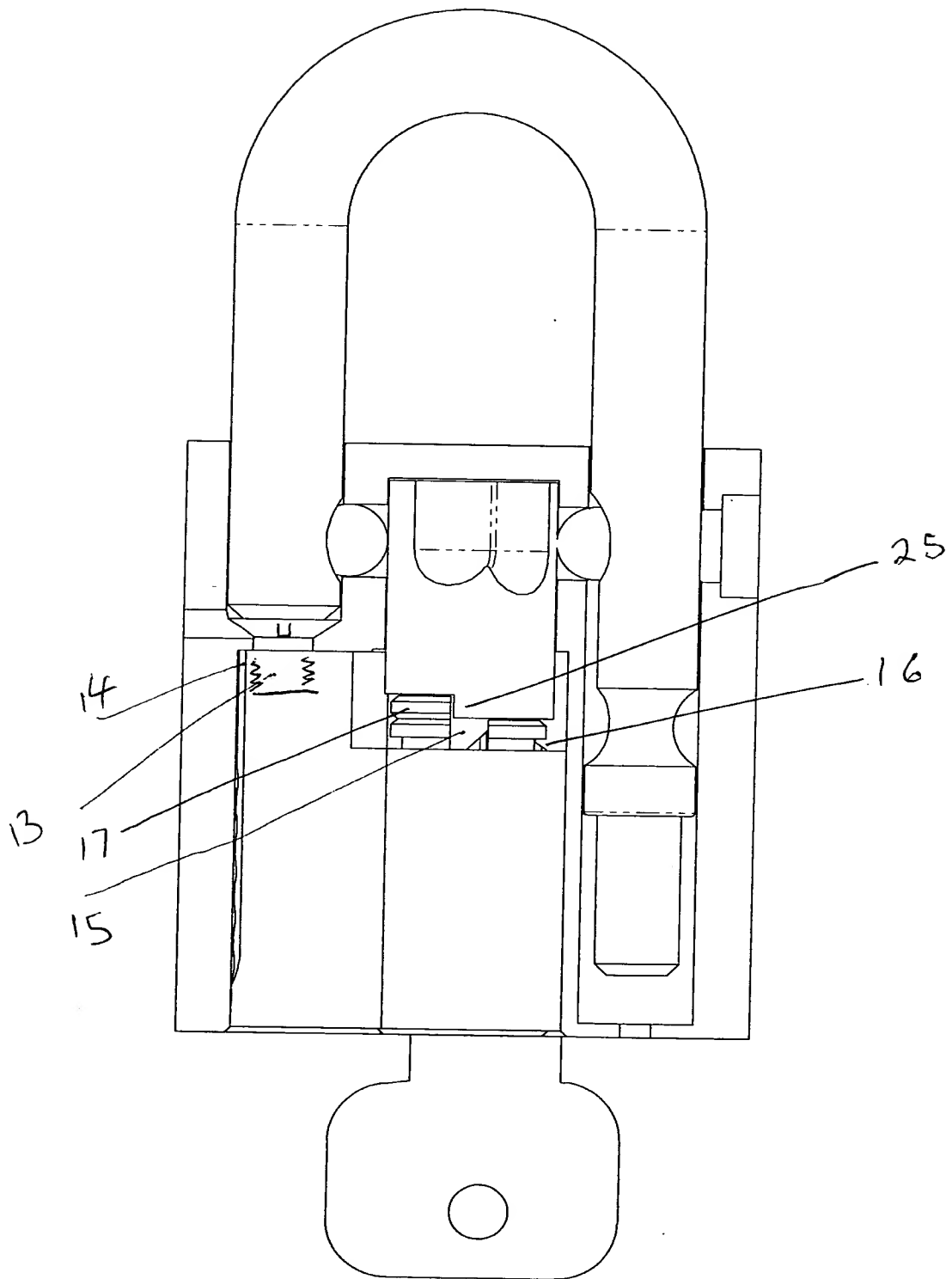


Fig 1

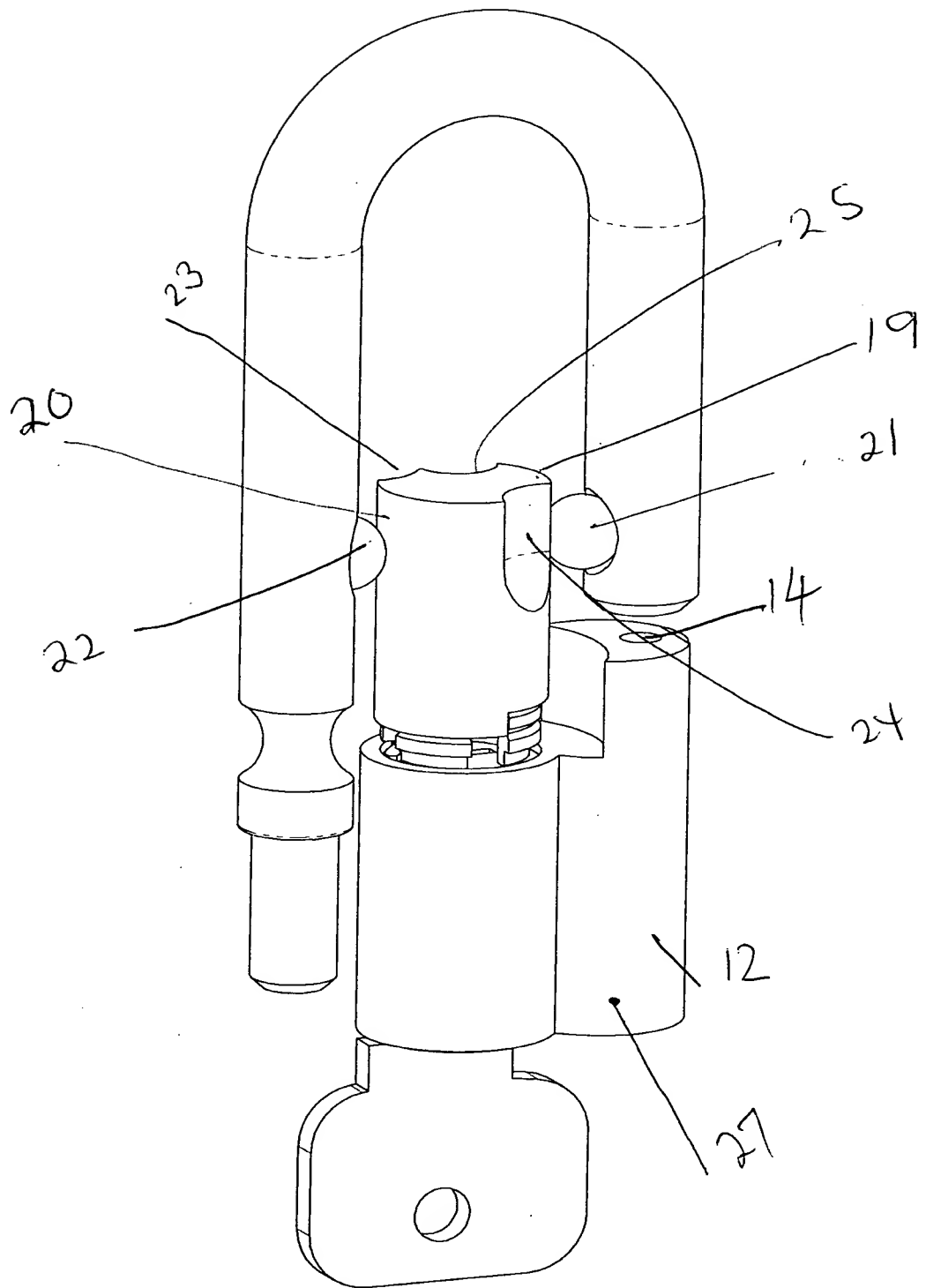


Fig 2

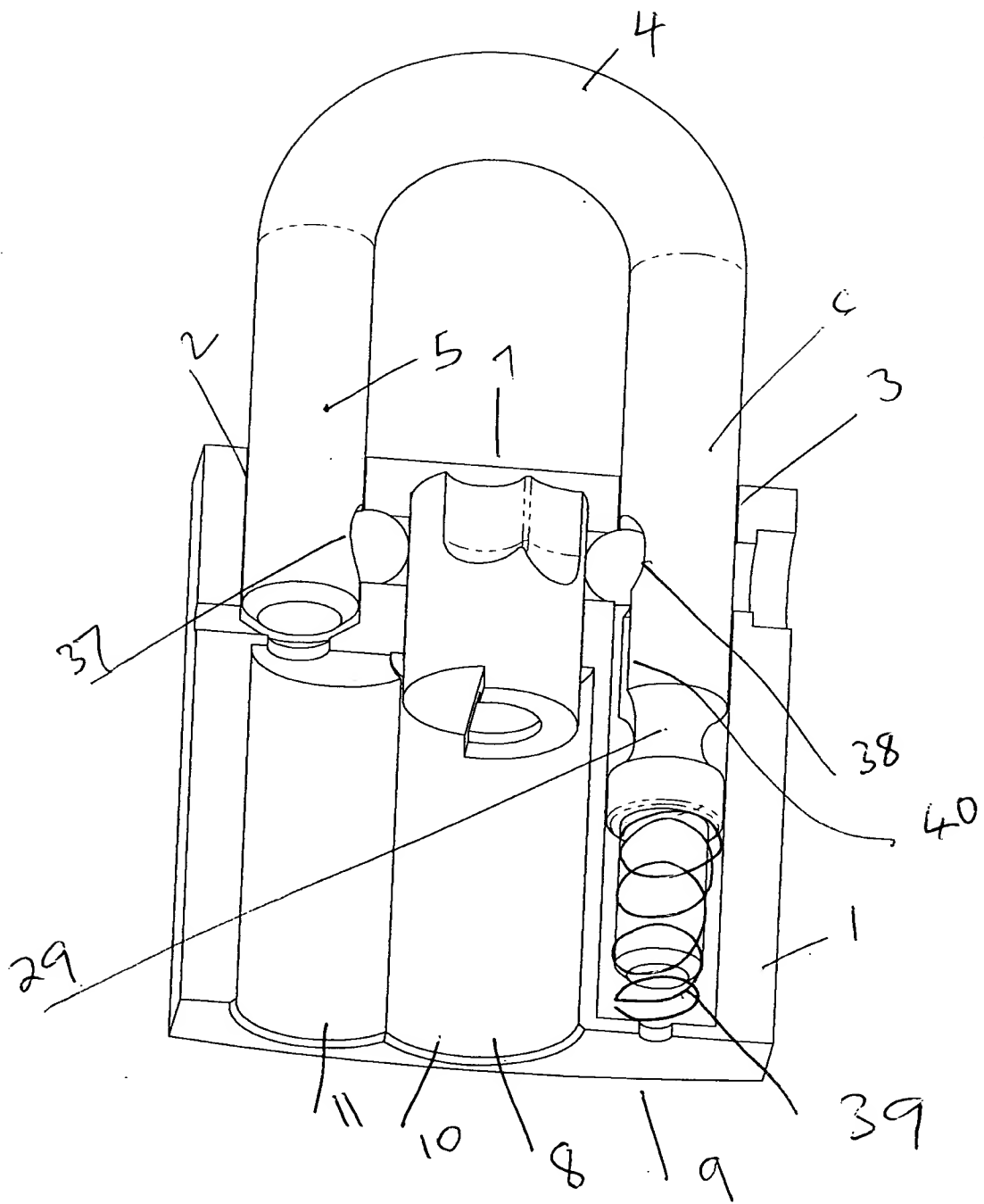


Fig 3

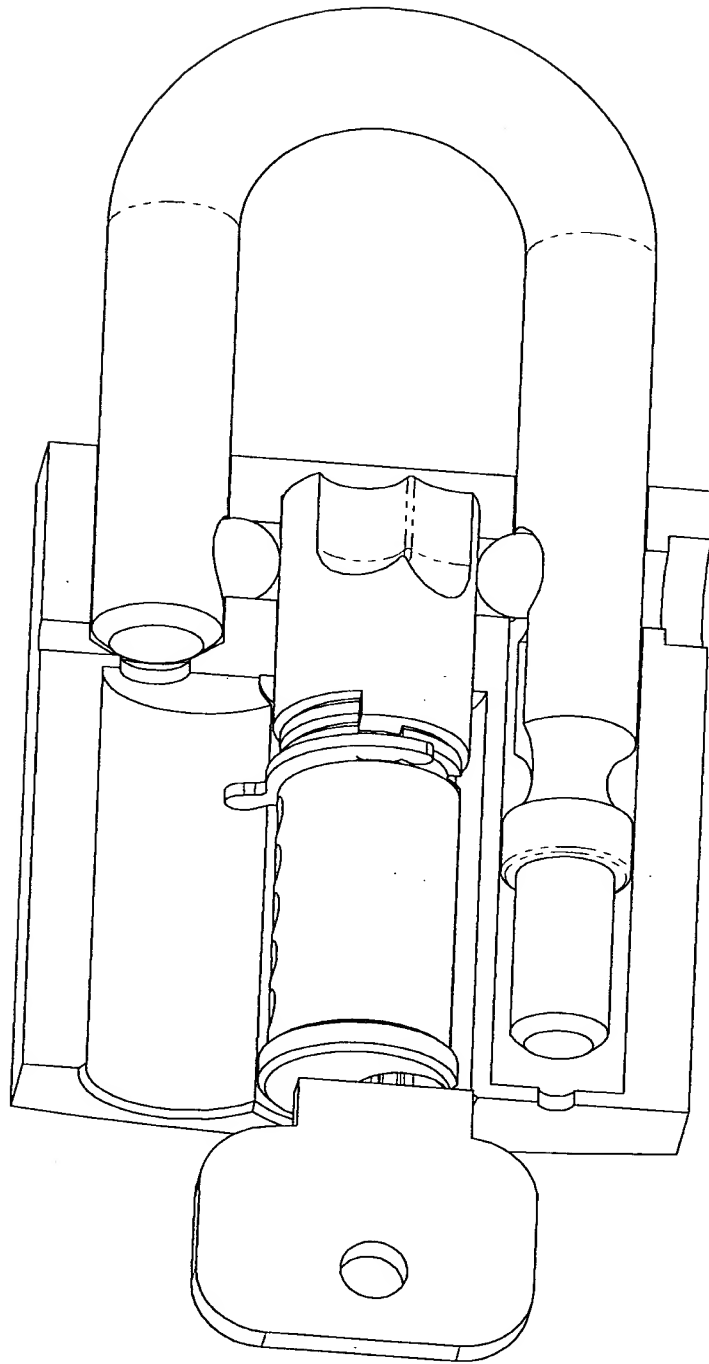


Fig 4

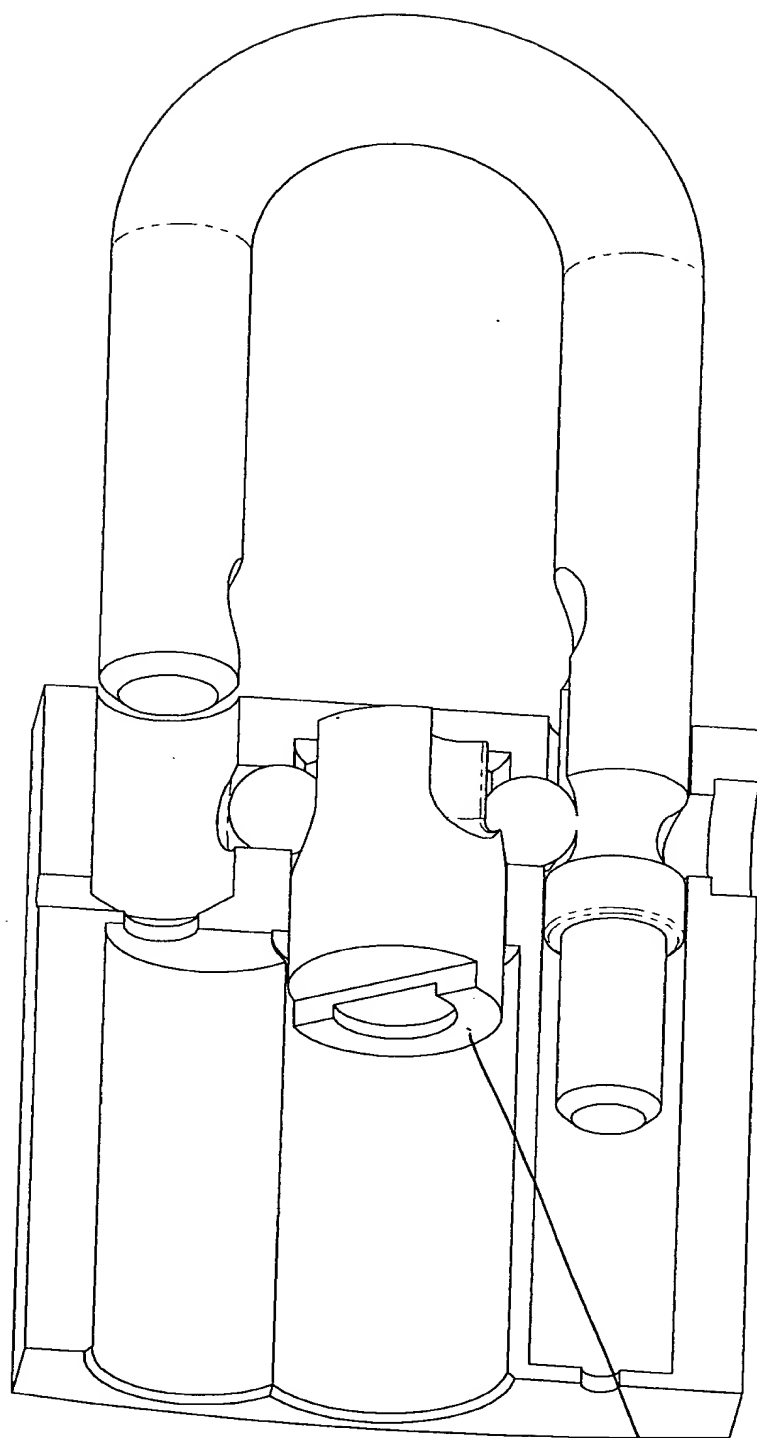


Fig 5

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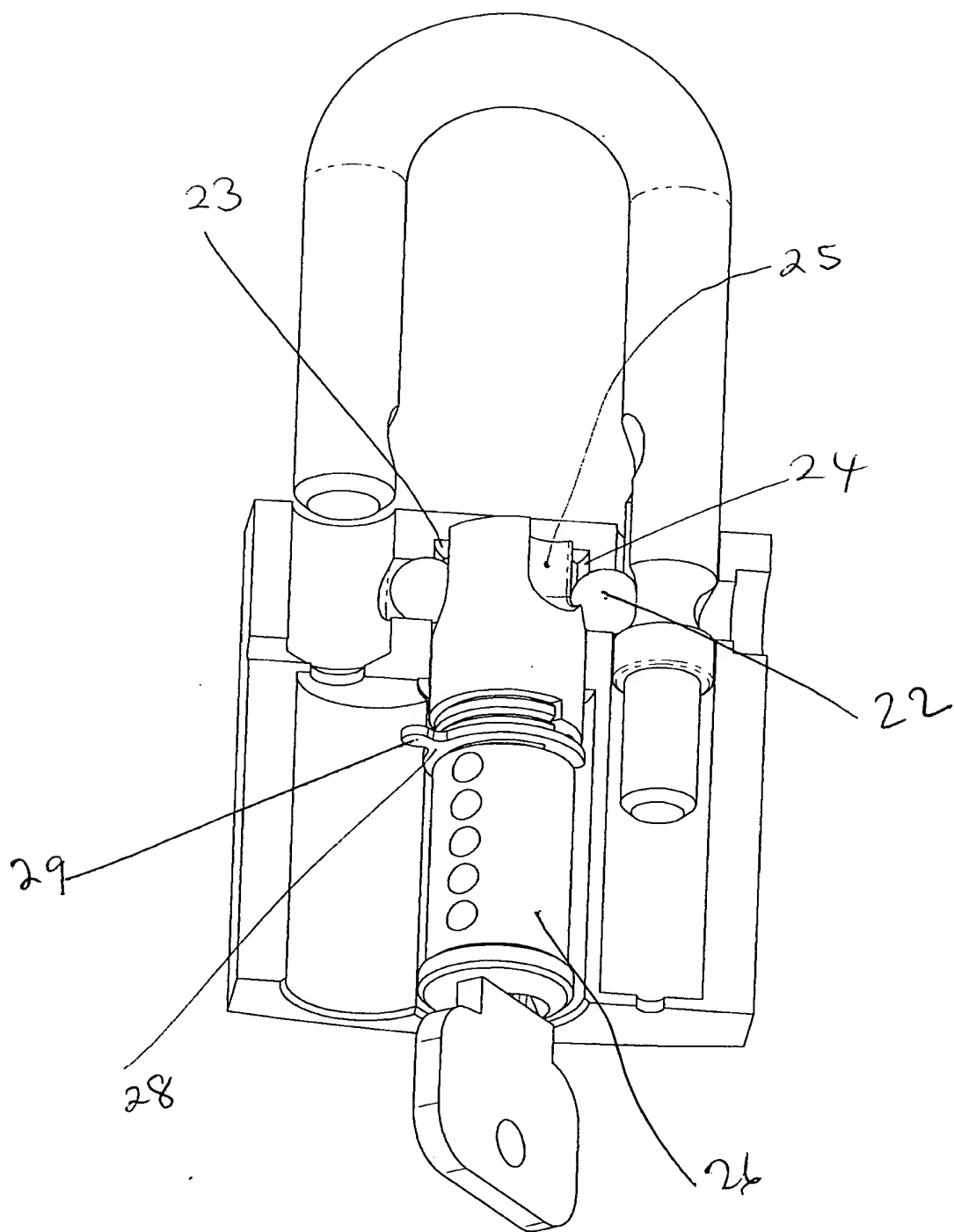


Fig 6

Cross slot
intersecting aperture
2 and 3 to provide
passage for the
balls

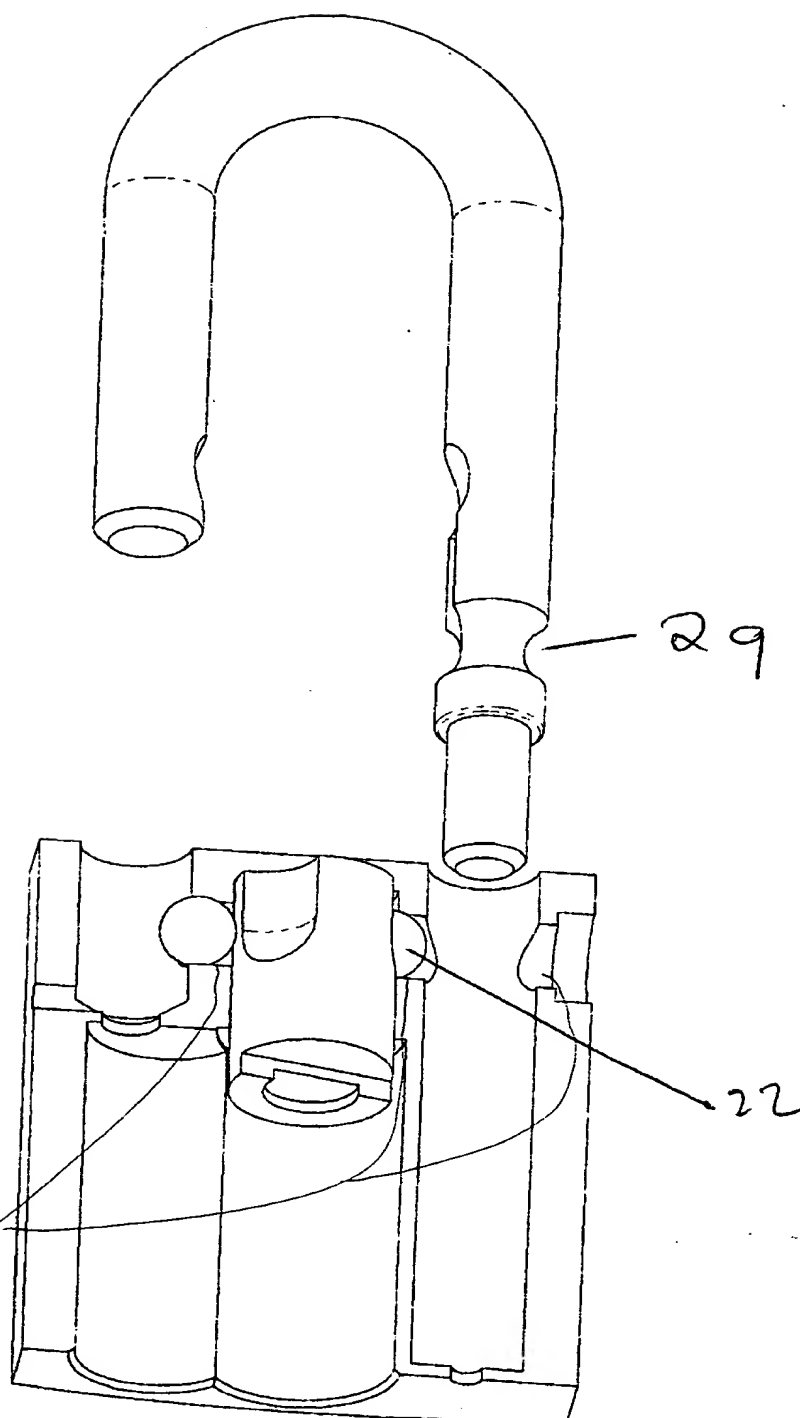


Fig 7

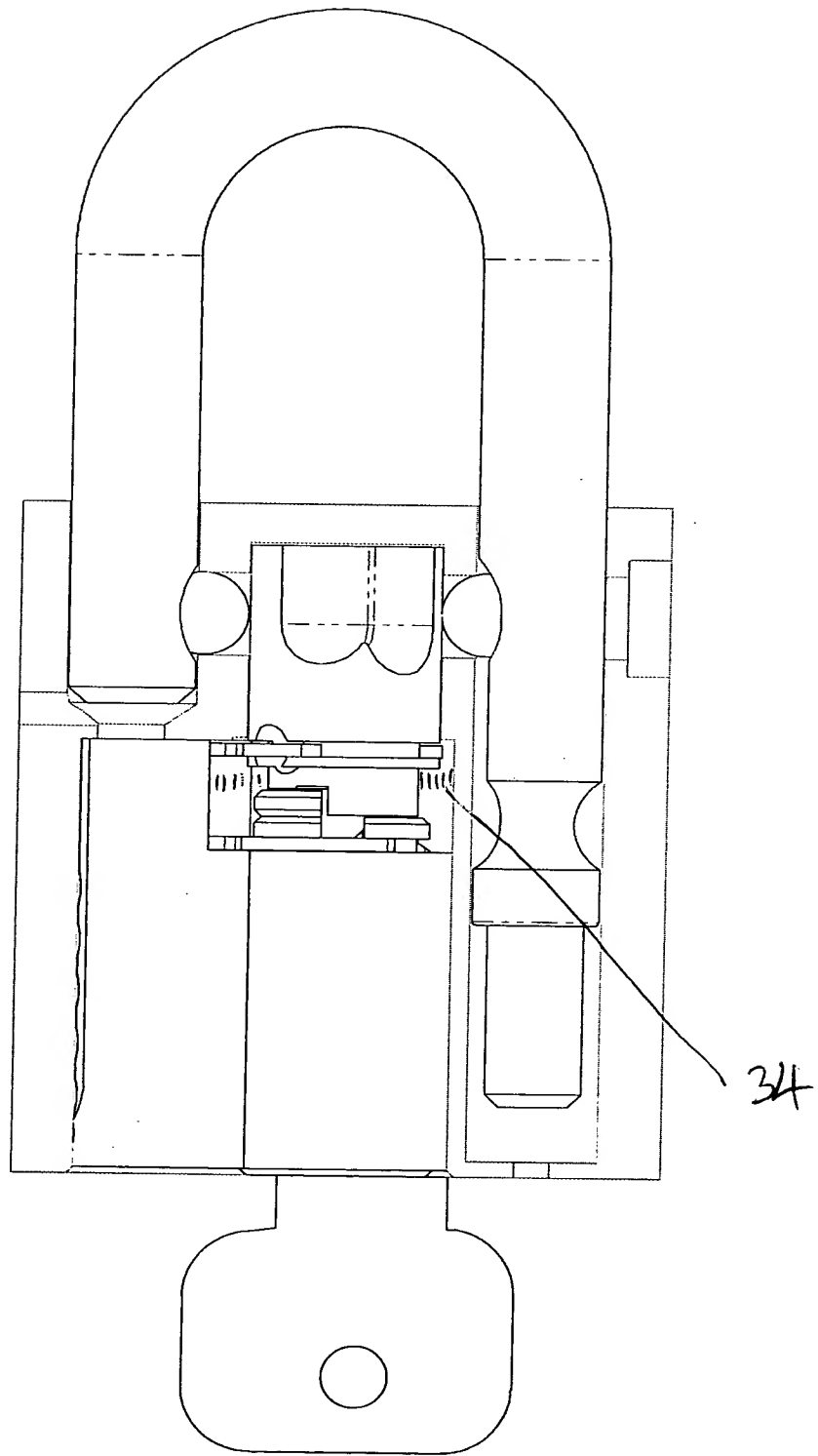


Fig 11

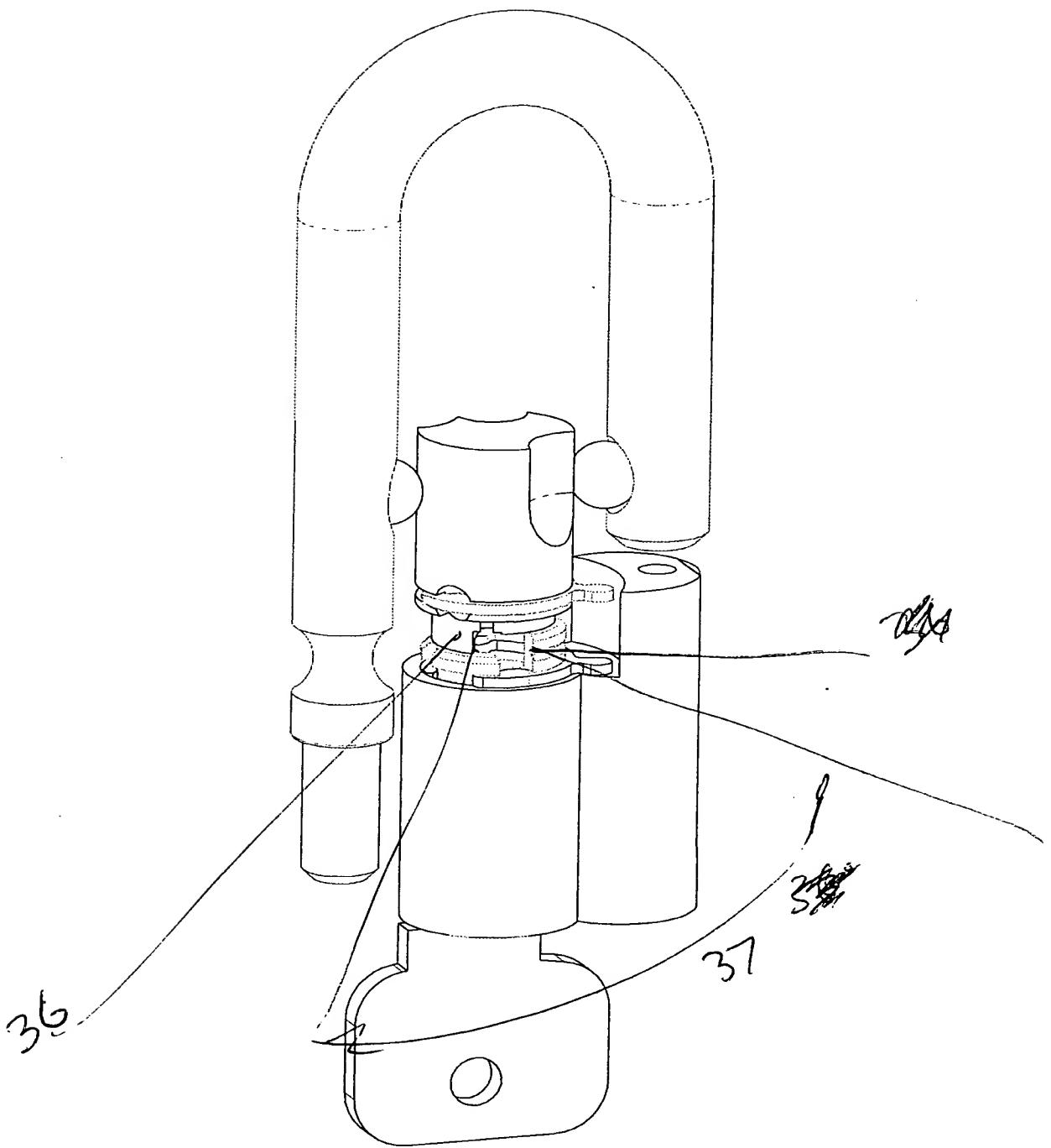


Fig 12

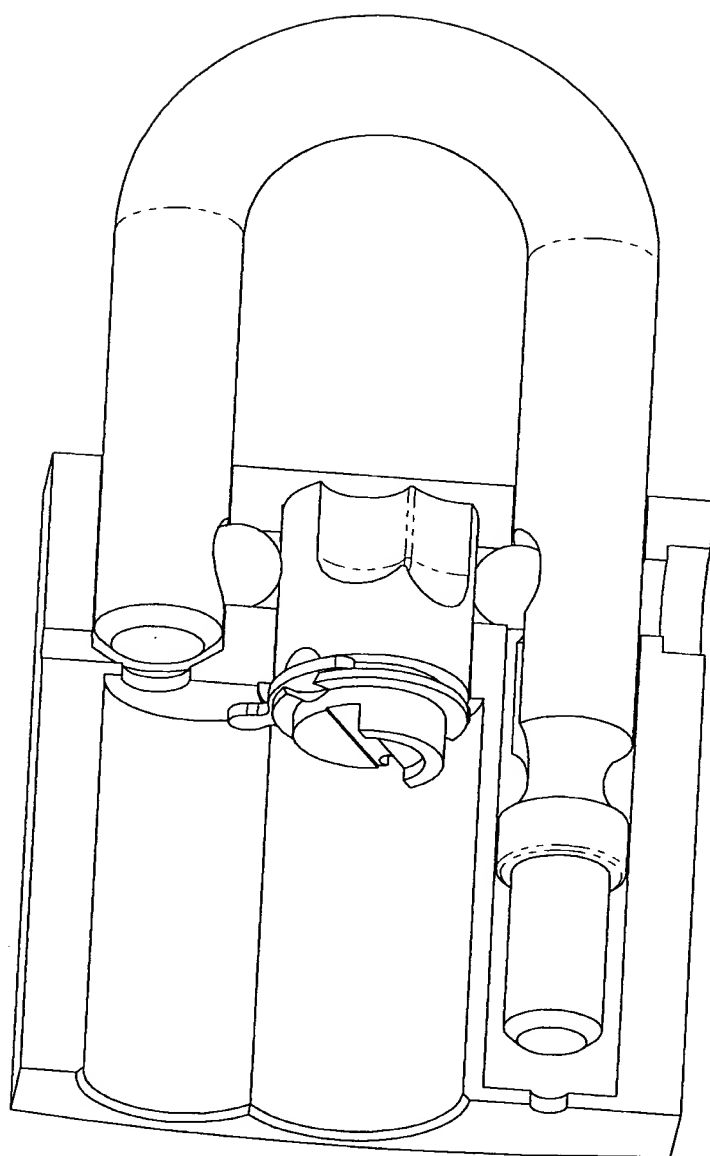


Fig 13

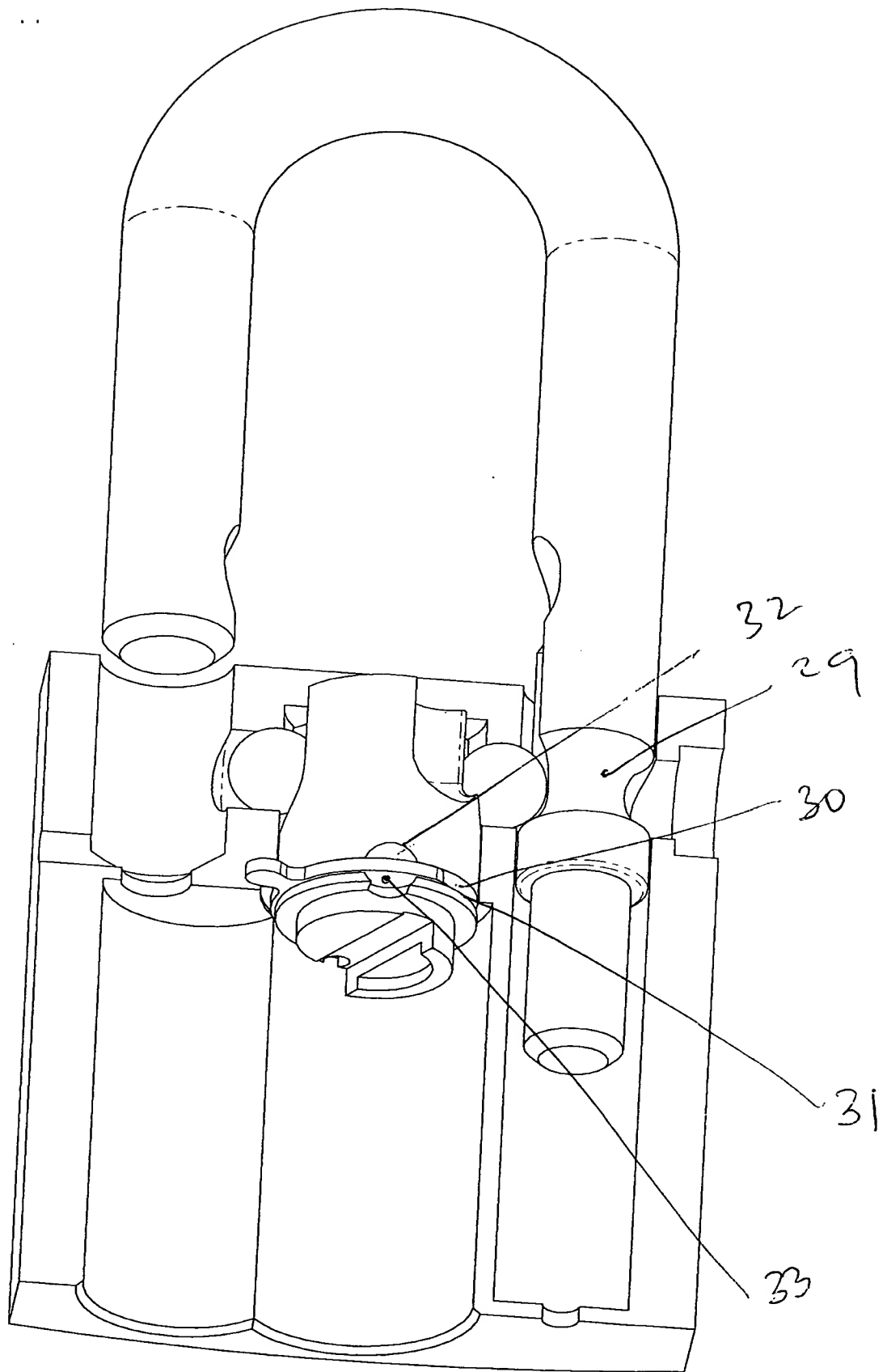


Fig 15

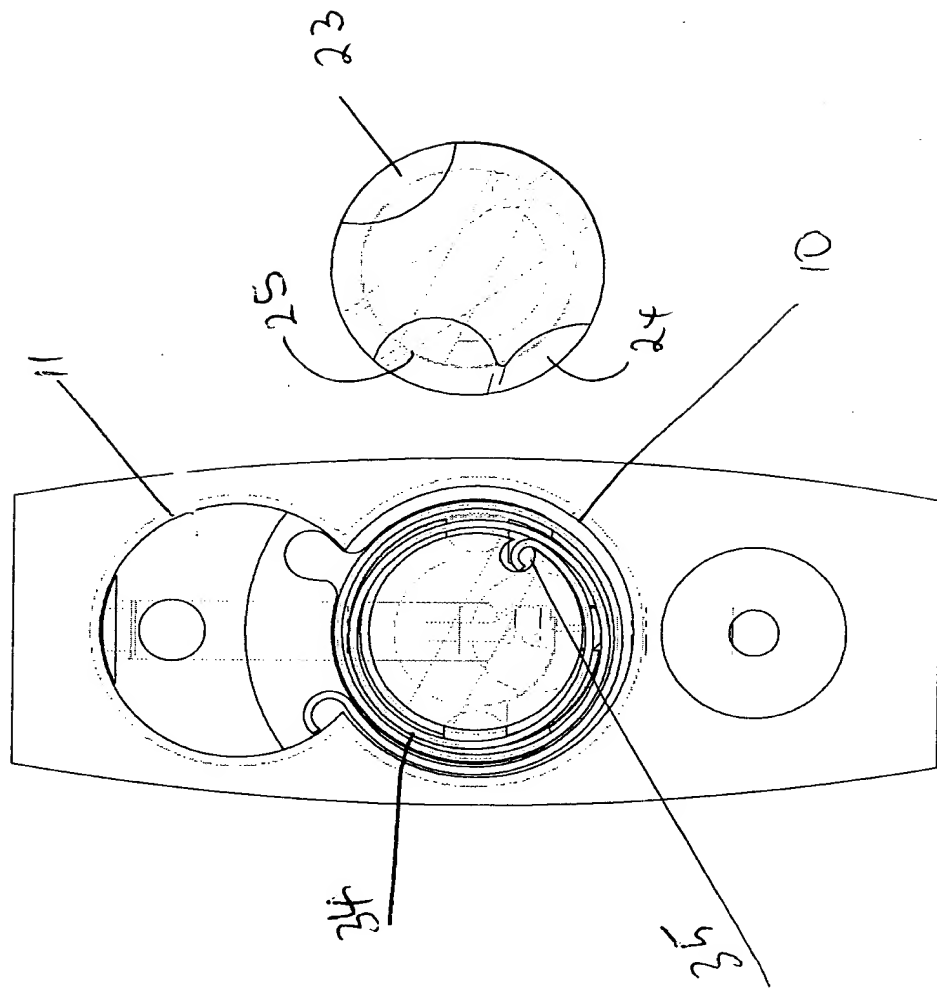


Fig 16